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DETECTION AND EVALUATION OF SOUTHERN PINE BEETLE
INFESTATIONS ON THE TIAK DIVISION OF THE
OUACHITA NATIONAL FOREST IN OKLAHOMA

U. S. Forest Service
Pineville, Louisiana

U. S. DEPARTMENT OF AGRICULTURE -- FOREST SERVICE
SOUTHEASTERN AREA, STATE AND PRIVATE FORESTRY
RESOURCE PROTECTION UNIT, FOREST INSECT AND DISEASE MANAGEMENT GROUP

DETECTION AND EVALUATION OF SOUTHERN PINE BEETLE
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OUACHITA NATIONAL FOREST IN OKLAHOMA

by

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INTRODUCTION

On September 23, 1975, during a routine insect and disease detection survey of the Tiak Division of the Ouachita National Forest, Oklahoma, several spots of dying pine trees were observed. Ground checks of these spots revealed infestation by the southern pine beetle, Dendroctonus frontalis, Zimm. This was the first known southern pine beetle population in Oklahoma in modern history.

On October 6-9, 1975, an evaluation was conducted on this area to determine the status and extent of the beetle infestation.

METHODS

Standard aerial sketch map procedures were used in this evaluation.^{2/} Aerial survey area coverage was 100 percent. Six spots containing 380 trees were examined to determine the cause of mortality, number of affected trees, number of currently infested trees and the general condition of the beetle population.

TECHNICAL INFORMATION

Insect - Southern pine beetle, Dendroctonus frontalis, Zimm.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, Pinus taeda L., and shortleaf pine, Pinus echinata, Mill., are the preferred hosts.

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^{2/}Detection of forest pests in the Southeast. 1970. USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF-7, Atlanta, Georgia, 51 pp.

Type of Damage - Tree mortality results from cambial mining by the southern pine beetles as they construct egg galleries. The beetles also introduce blue staining fungi, Ceratocystis spp., which block conduction tissues which accelerates the kill.

Life Cycle of the Insect - The beetles attack in pairs and construct winding egg galleries in the cambium. Eggs are deposited along the galleries. Eggs hatch into whitish grubs that further mine the cambium and then construct cells in the outer bark for pupation. After transforming to adults, the beetles emerge. The life cycle is completed in about 30 days during the warmer months. There may be as many as seven generations produced each year.

RESULTS AND DISCUSSION

Results of this evaluation are summarized in Table 1. The data show that the southern pine beetle is currently at epidemic levels on the Tiak Division. However, based on the size and number of spots, the bulk of beetle activity is concentrated in a 12 square mile area located between Bokhoma Recreation Area and the Town of Bokhoma and south to Ward Lake (Fig. 1).

All infestations examined were extremely active. Based on the size of some spots (up to 175 trees), and the relatively large number of green trees infested with heavy beetle broods, the population is increasing. The southern pine beetle has a very high biotic potential and if conditions remain favorable for its development, this insect can cause widespread timber losses in a relatively short period of time. On this area the potential exists for more extensive losses this fall and next spring. Therefore, it is suggested that consideration be given to initiating control measures immediately.

There are at present no known southern pine beetle infestations outside the Tiak Division's protection boundary.

RECOMMENDATIONS

1. Suppression should be carried out in accordance with guidelines in the 5250 section of the Forest Service Manual as follows:
 1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

Table 1. Summary of results of southern pine beetle evaluation conducted on the Tiak Division, Ouachita National Forest, Oklahoma, October 1975.

	: Ownership Unit
	: Tiak Division, Ouachita N.F., Okla.
	<u>F. Y. 1975</u>
1. Results compiled from data collected during the aerial phase of the evaluation:	
Survey type	Aerial sketchmap
Date of survey	Oct. 4, 1975
Percent survey	100
Total acreage surveyed	155,649
Total susceptible host type acreage	34,000
Total number of spots within survey boundary	193
Spots per M acres of host type	5.69
Average spot size (trees)	2.58
Range of spot sizes (trees)	1 - 30
Reds and Faders/M acres host type	14.70
2. Results compiled from data collected during the ground and aerial phases of the evaluation:	
Date of ground phase	Oct. 8, 1975
Infested trees/M acres of host type	6.03
Total number of infested trees within survey boundary	205
Ratio of green infested to total red and fading trees	1:1.92
Total volume of infested trees	2,592 cu. ft.
Total volume of affected trees	3,700 cu. ft.

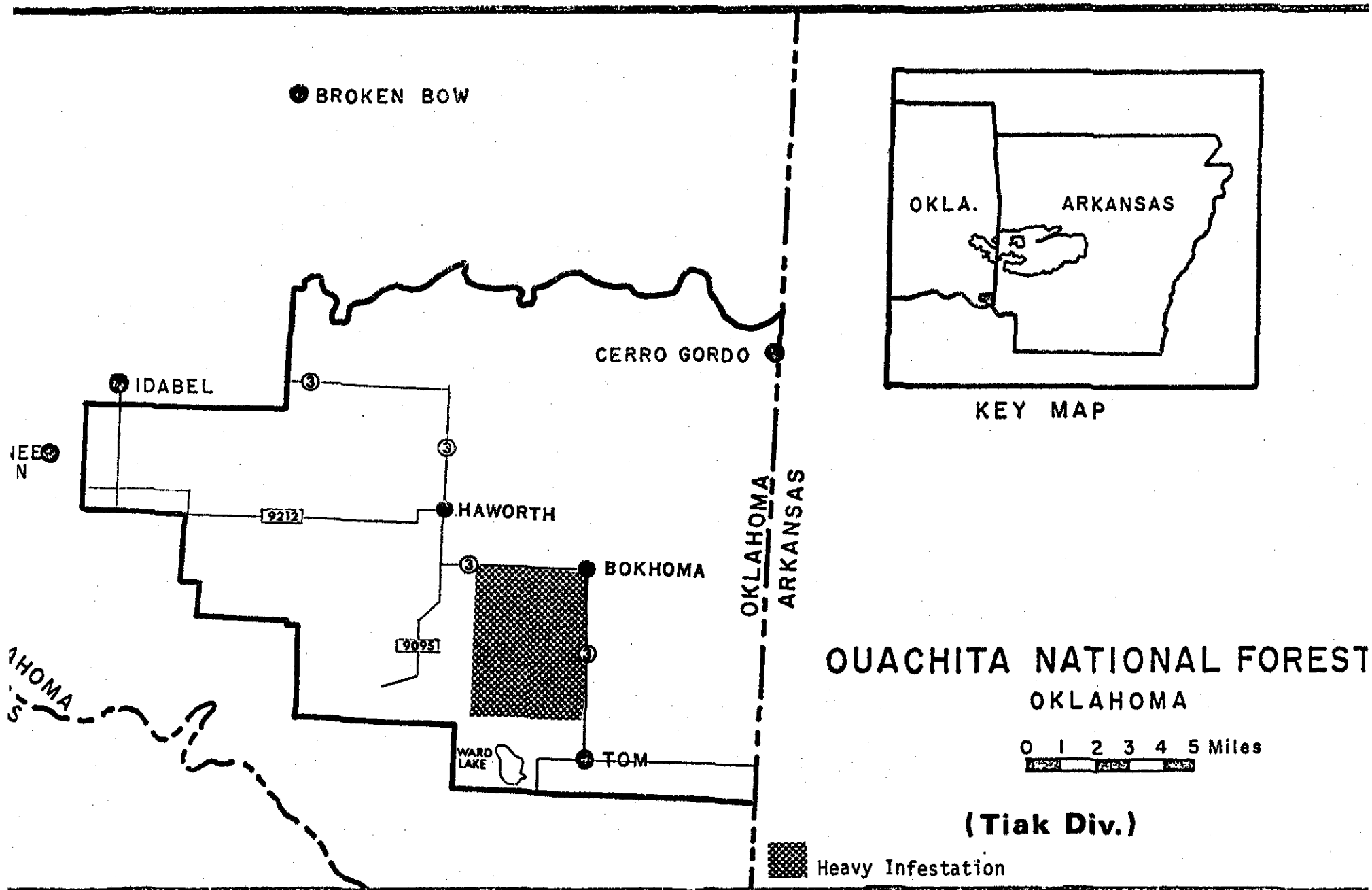


Figure 1.--Location of heavy southern pine beetle infestations on the Tiak Division, Ouachita National Forest, Oklahoma, October 1975.

Where practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts." When only a small volume of infested merchantable material occurs in a spot, non-infested trees surrounding the spot may be marked to provide an operable cut.

The order of priority for removing beetle infested timber from a spot should be as follows:

Trees having nearly developed broods (usually the red and fading trees).

Trees having young broods (usually the green, recently infested trees).

Trees in the buffer zone.

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly the large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.
3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a 1/2 percent Lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent lindane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent lindane EC to 39 parts No. 2 diesel fuel.)

Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of run-off. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large, accessible infestations.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key--out of the reach of children and animals--away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetles have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in section 8.3 of the Forest Service Health and Safety Code and FSM 5242.21. Detailed safety procedures should be outlined in the project suppression plan.

2. Initial suppression efforts should be concentrated in areas of heaviest beetle activity (Fig. 1).
3. If the Tiak Division Ranger needs assistance in preparing documents required for funding a project, he should notify the Pineville Field Office, Forest Insect and Disease Management.